Potential Fuel Savings*

Technology Scenarios	Annual Fuel Consumed (Gallons/Year)	% Fuel Savings
Basecase (No Smart Grid or Renewables)	135,503	-
With Smart Grid and Energy Storage	113,067	16.6%
With Smart Grid, Energy Storage, Insulated Shelter and Sized HVAC	105,584	22.1%
With Smart Grid, Energy Storage, Insulated Shelter, Sized HVAC, and PV	101,974	24.7%
With Smart Grid, Energy Storage, Insulated Shelter, Sized HVAC, PV and Solar Water Heating	58,613	56.7%

* Potential fuel savings from *PNNL SAGE Conceptual Design Report*, February 2011. Baseline annual fuel use estimate from: *Force Provider Electrical Survey, Analysis, and Market Investigation*, prepared by TIAX LLC, July 2006

Design Requirements

- Micro-grid operates independently or connects to an available host nation power grid
- Commercial equipment rugged enough for use at medium size FOBs
- Automated smart grid is easy to operate and maintain
- Interoperable with international electrical codes
- Uses standardized interfaces and controls to provide scalability
- Shelters are transportable by organic military equipment and do not require MHE or ground preparation for construction or de-construction
- Energy storage provides up to 12 hours of “silent camp” capability

Stakeholders

Pacific Northwest NATIONAL LABORATORY

Points of Contact

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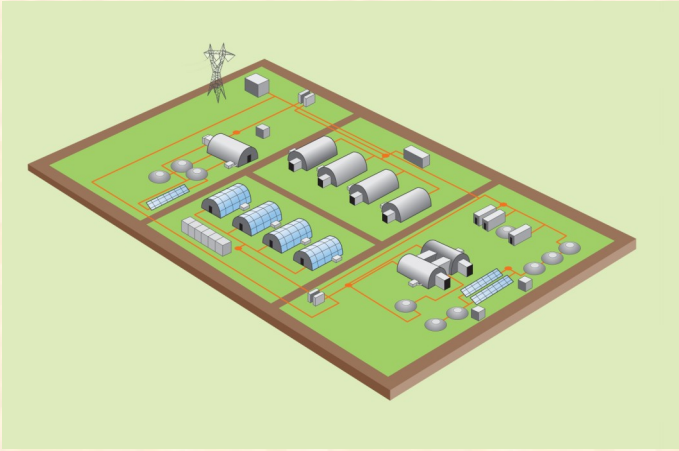
Smart And Green Energy (SAGE) For Base Camps



US Army LOGISTICS INNOVATION AGENCY (LIA)

Vision

Reduce the quantity of JP8 needed for electrical power generation at contingency bases by employing novel utility smart micro-grid technologies, energy efficient structures, and renewable energy sources.

Demonstration Objectives

- Test and evaluate a smart micro-grid prototype to achieve a ~ 30% - 60% reduction of JP-8 consumption
- Employ intelligent and automated control technologies
- Develop a “build to” design package that enables construction by military engineers
- Deliver contract language to PM LOGCAP and other contracting authorities

Benefits

- Provides a holistic solution for energy generation, storage, and management
- Enables a Camp Mayor to better control and manage base camp power operations
- Stores “unused” energy for later use
- Employs common international electrical standards
- Improves Soldier Quality-of-Life

Key Points

- LIA working with ARCENT to demonstrate a prototype micro-grid design for medium sized theater camps
- Project addresses a theater’s operational base camp needs while complementing RDECOM work on tactical micro-grids
- Demonstration is being conducted in partnership with Product Manager Force Sustainment Systems (PM FSS) at the Systems Integration Lab (SIL) located at Fort Devens, MA
- Goal is to develop a Government-owned, open source, design specification for an energy saving smart micro-grid where grid construction can be built by military engineers

Future positioning of SAGE technologies at the Fort Devens Systems Integration Lab (SIL):

(1) photovoltaic array
(2) energy efficient structures
(3) smart power generation and storage
(4) solar hot water system

Components

Smart Micro-Grid Technologies


Storage and Power Generation


Alternative Energy Sources


Energy Efficient Shelters